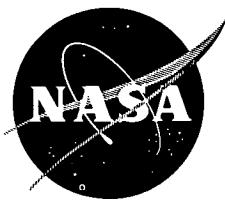
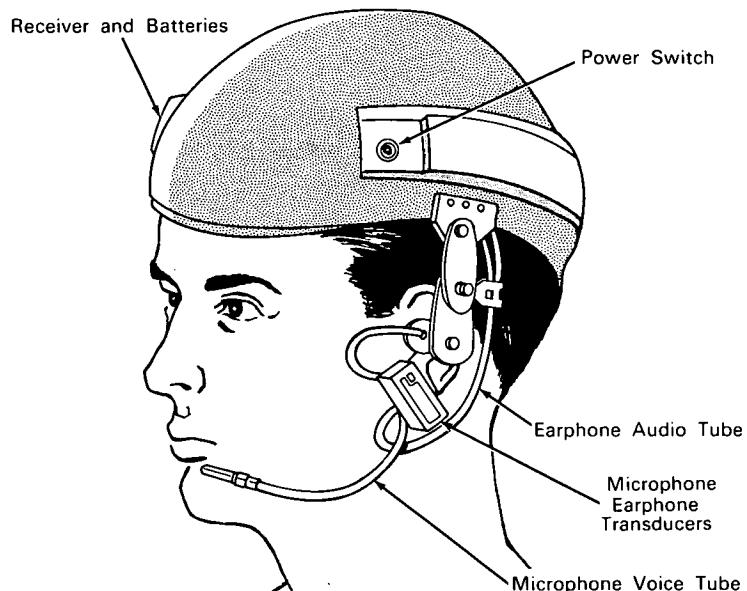


# NASA TECH BRIEF



This NASA Tech Brief is issued by the Technology Utilization Division to acquaint industry with the technical content of an innovation derived from the NASA space program.

## Comfortable, Lightweight Safety Helmet Holds Radio Transmitter, Receiver



**The problem:** To provide communications by portable two-way radio under circumstances which require the wearing of a safety helmet. To date, safety helmets incorporating self-contained transceivers have been unwieldy and heavy, often with protruding components. Two-way radio components were mounted inside the helmet with only the webbing to prevent them from contacting the skull.

**The solution:** A lightweight, form-fitting safety helmet incorporating both an inner and outer shell, resilient padding instead of webbing, and a two-way radio located mainly between the two shells. External protrusions are small, permitting the helmet to be worn under other headgear and other protective clothing.

**How it's done:** The communications/safety helmet is constructed with two nesting hard shells having electronic components and a power supply mounted between the shells. The inner shell is form-fitting and is lined with a resilient padding for wearer comfort and safety. The outer helmet shell nests closely over the inner, but is formed with protrusions, or lobes, on either side to allow more space for mounting the radio components and power supply. A helical antenna is also hidden within the outer shell.

For safety, the microphone arm is made of a flexible material and will not endanger teeth or mouth. When the arm is moved to its stowed position, a power switch automatically turns off the transmitter. A lightweight miniature earphone is made so that

(continued overleaf)

it is interchangeable with an ear-cup type of earphone for use when it is necessary to screen out noise where ambient sound levels are high. Lifting out and turning up the cup-type headset turns off power to the receiver. Microphone arm and earphone may be mounted on either side or, if required, on both sides.

Nickel-cadmium batteries are charged via a plug mounted permanently in the helmet. The plug permits another line, such as an intercommunications system, to be connected into the unit when communications other than radio are desired. If desired, the inner shell can be worn alone as a safety helmet. It can also be worn with a lightweight headset for working in low noise-level areas or plugged into a hand-carried RF transceiver.

**Notes:**

1. A law enforcement officer wearing this communications helmet could maintain constant communication with others, or with police headquarters, even after leaving his car.

2. Firefighters working in situations where two-way communication is desirable could wear the helmet under standard protective clothing. If a fireman were wearing an asbestos suit, the helmet could provide telemetry to warn of a dangerous temperature increase.
3. Construction workers, in many situations, would benefit by frequent or constant communications afforded by this innovation. Examples include workers assembling large and awkward equipment, pulling electric cable, and directing traffic on big earthmoving projects.
4. For further information about this innovation inquiries may be directed to:

Technology Utilization Officer  
Manned Spacecraft Center  
P.O. Box 1537  
Houston, Texas 77001  
Reference: B64-10015

**Patent status:** NASA encourages the commercial use of this innovation. No patent action is contemplated.

Source: Manned Spacecraft Center  
(MSC-53)